REMARKS

Claims 1-26 currently appear in this application. The Office Action of June 20, 2007, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicant respectfully requests favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Specification

The specification is objected to because the specification does not contain a brief description of the drawings.

The present amendment provides a brief description of the drawings.

Claim Objections

Claims 4-26 are objected to under 37 CFR 1.75(c) as being of improper dependent form because a multiple dependent claim cannot depend from any other multiple dependent claim.

The present amendment corrects the improper multiple dependency.

Art Rejections

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stansbury, Jr. et al, IS 3,130,234 in view of van Deck, US 2081719.

This rejection is respectfully traversed. Stansbury teaches that glyoxal tetraethylacetal obtained by reacting ethanol and nitrosyl chloride may be extracted, in the second purification step, with an organic solvent such as ether. Van Dijck discloses a general process of liquid-liquid extraction.

The presently claimed invention is directed to selectively separating a glyoxal diacetal from a reaction mixture obtained on conclusion of the acetalization reaction. This reaction mixture contains the diacetal as well as glyoxal monoacetal. Stansbury does not use a reaction mixture containing glyoxal or glyoxal monoacetal, and there is no countercurrent extraction process. This has little to do with the presently claimed method, which is directed specifically to obtaining pure glyoxal diacetal from a mixture of glyoxal diacetal and glyoxal monoacetal.

Van Dijck adds nothing to Stansbury, because van Dijck merely discloses that countercurrent extraction is a known extraction method.

It should be noted that the specification at page 4, line 25 to page 5, line 5, notes that it was surprisingly observed that glyoxal diacetal, and in particular TME, has a partition behavior which is very different from that of the corresponding glyoxal monoacetal withy respect to the solvent when both the diacetal and the monoacetal are present in an aqueous phase. Furthermore, the partition of glyoxal diacetal, in particular TME, towards the solvent is very different when it is found alone in aqueous phase and when it is found in a mixture with the corresponding glyoxal monoacetal. Therefore, one skilled in the art would not expect that extraction of glyoxal diacetal from a mixture of components other than glyoxal monoacetal would be possible with the same solvent, given the differences in partition coefficients in different mixtures.

There is nothing in the combination of Standsbury and van Dijck that teaches, suggests, or motivates one skilled in the art to use countercurrent extraction to selectively separate a glyoxal diacetal from a reaction mixture which contains said diacetal as well as glyoxal monoacetal.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Babler. UIS 5,197,127 in view of Wessendorf et al., US 4,065,506. This rejection is respectfully traversed.

Babler discloses a process for preparing chlorotrialkoxyethane comprising the following steps:

1. Forming a first reaction mixture in the presence of aqueous glyoxal, of a catalytic amount of acid and an alcohol;

2. isolating glyoxal diacetal from the first reaction mixture;

3. forming a second reaction mixture in the presence of glyoxal diacetal, a chloride reagent and a catalytic amount of acid; and

4. isolating the chlorotrialkoxyethane thus formed from the chlorotrialkoxyethane.

In example II, glyoxal (40 wt% solution) is reacted with ethanol (in large excess) in the presence of toluene sulfonate (acid catalyst) and benzene (azeotropic solvent). The reaction mixture is heated at reflux for eight hours with continuous azeotropic removal of water.

There is no indication whatsoever as to the composition of the reaction mixture thus obtained. Babler only mentions that specific yields of bisacetal given in the literature is approximately 80% when methanol is used (column 3, lines 8-10).

The preparation of the crude reaction mixture in Babler differs from the herein claimed method particularly in

that in the claimed process, water is not removed during the reaction, and no azeotropic solvent is used.

Example II further indicates that, after various treatments to the reaction mixture, "the product" is removed from the aqueous layer by extraction with methylene chloride and distilled (column 7, lines 6-12).

There is no teaching in Babler that it is possible to selectively extract a glyoxal diacetal with a solvent from the reaction mixture containing the diacetal and a glyoxal monoacetal. Babler only teaches that it is possible to extract a glyoxal diacetal from an aqueous mixture with methylene chloride and organic solvent.

It should be noted that the specification at page 4, line 25 to page 5, line 5, notes that it was surprisingly observed that glyoxal diacetal, and in particular TME, has a partition behavior which is very different from that of the corresponding glyoxal monoacetal withy respect to the solvent when both the diacetal and the monoacetal are present in an aqueous phase. Furthermore, the partition of glyoxal diacetal, in particularly TME towards the solvent is very different when it is found alone in aqueous phase and when it is found in a mixture with the corresponding glyoxal monoacetal. Therefore, one skilled in the art would not expect that extraction of glyoxal diacetal from a mixture of

components other than glyoxal monoacetal would be possible with the same solvent.

Wessendorf adds nothing to Babler because Wessendorf merely discloses a process for refining crude glyoxal solutions including semiacetalizing glyoxal with a C_1-C_3 alcohol, and a step of continuously extracting, optionally countercurrent extracting, the glyoxal semiacetal formed in the aqueous reaction mixture with an organic solvent that cane be methylene chloride, cyclohexane or toluene. However, the reaction mixture Wessendorf refines differs from that in the herein claimed process, because glyoxal **semiacetals** are not the same as glyoxal **diacetals**. Therefore, glyoxal semiacetals and glyoxal diacetals behave differently with respect to solvent. That is, they have different partition coefficients, particularly when extraction is performed countercurrently.

The instant specification shows in example 4 that TME and DME have different partition coefficients.

Moreover, Wessendorf discloses removing byproducts formed during the preparation of glyoxal by nitric oxidation of acetaldehyde, in particular, some acids of low volatility such as glyoxalic acid (column 1, lines 22-37). This is not at all the same as the presently claimed process, and there is no suggestion in Wessendorf with respect to glyoxal monoacetals or diacetals.

It is noted that the prior art made of record but not relied upon is merely considered to be pertinent to applicant's disclosure.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant

By: /Anne M. Kornbau/
Anne M. Kornbau
Registration No. 25,884

AMK:srd
Telephone No.: (202) 628-5197
Facsimile No.: (202) 737-3528
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